

## II. Claims 4-38 Do Not Improperly Recapture Claimed Subject Matter

Claims 4-38 do not improperly recapture any subject matter surrendered during prosecution of the original application for patent (U.S.S.N. 09/986,447 hereafter referred to as the ‘447 application). Rather, as discussed in greater detail below, the inventions of claims 4-38 were never presented for prosecution in the ‘447 application. Claims 4-38 define patentable inventions independent or distinct from the inventive subject matter of original claims 1-3 of the issued patent. Therefore, the recapture rule is inapplicable.

In addition, even if claims 4-38 were not independent or distinct from the inventive subject matter of original claims 1-3, when each of the three steps of the recapture rule is properly considered, claims 4-38 do not violate the recapture rule.

### A. Original Claims 1-3 and 4-38 are Distinct and Independent Inventions Directed to Subject Matter Originally Overlooked by Applicant

While not presented in the original ‘447 application, the inventions of reissue claims 4-38 are supported by the specification as originally filed. That is, the disclosure requirements of 35 U.S.C. § 251 are met by the original patent for the independent and distinct inventions defined by claims 4-38. Applicant presented in the Preliminary Amendment For Reissue Application (page 9) detailed tables listing exemplary support in the specification for the reissue claims.

The inventions of reissue claims 4-38 were never claimed in the original ‘447 application. That is, claims were never presented in the original application to the patentable inventions of reissue claims 4-38. Rather, as discussed in greater detail below, claims 4-38 are independent and distinct from claims 1-3. That is, the subject matter of original claims 1-3 is independent and distinct under 35 U.S.C. § 121, from the inventions defined now by reissue claims 4-38. In fact, had reissue claims 4-38 been presented in the ‘447 application, a restriction requirement could properly have been entered by the Examiner. In this regard, the recently amended rules relating to examination of reissue applications make clear that restriction may be required between subject matter of the original patent claims and previously unclaimed subject matter. See 37 C.F.R. § 1.176. Thus, it is contemplated that an invention may be claimed in a reissue

application that is independent or distinct from the invention of the originally issued claims.

The independent and distinct nature of the inventions of reissue claims 4-38 is evidenced by Applicant's reissue declaration:

Applicant failed to claim inventive methods and apparatus disclosed in the specification ... directed to (1) modulation of the capacity of the compressor or of an air conditioning or refrigeration system via cycling a controlled valve with a cycle time shorter than the response time of the system; and/or (2) modulation of the capacity of a compressor of an air conditioning system or refrigeration system by cycling a controlled valve between its fully open position and its fully closed position.

The independent and distinct nature of the inventions of reissue claims 4-38 is now discussed in greater detail.

Claim 4 is directed to an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port; and a valve, in fluid communication with the compressor, operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. None of original claims 1-3 recite a valve in fluid communication with the compressor, wherein the valve is operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. To the extent any of the valves recited in original claims 1-3 are in genus/species relationship with the valve of reissue claims 4-38 operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity, the applicable law is clear that a patentable species and its patentable genus are independent and distinct inventions within the meaning of 35 U.S.C. 121. See MPEP § 806.04 ("Independent Inventions").<sup>1</sup>

This critical aspect, compressor capacity modulation by a valve operative to cycle with a cycling time shorter than the response time of the system, provides significant

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<sup>1</sup> See especially, e.g., MPEP § 806.04 Example (C): Applicant should be required to restrict the claims presented to but one of such independent inventions. For example: Where species under a genus are independent, for example, a genus of paper clips having species differing in the manner in which a section of the wire is formed in order to achieve a greater increase in its holding power.

advantages in compressor capacity modulation. As disclosed and discussed in the specification at Column 2, lines 39-47:

Pursuant to the teachings of the present invention solenoid valve 54 can be rapidly pulsed to control the capacity of compressor 12. Since the pulsing will be more rapid than the response time of the system 10, the system 10 responds as though the valve 54 is partially open rather than being cycled between its open and closed positions. Modulation is achieved by controlling the percentage of the time that valve 54 is on and off.

Because none of original claims 1-3 recite the valve of reissue claim 4 operative to cycle with a cycling time shorter than the response time of the system, reissue claim 4 is properly found to be independent and distinct from claims 1-3. Each of claims 5-8 depends directly or indirectly from claim 4 and is independent and distinct from original claims 1-3 for at least the same reasons.

Likewise, the invention of reissue claim 4 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port; and a valve, in fluid communication with the compressor, operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Accordingly, each of claims 4-8 is independent and distinct from original claims 1-3, and each of claims 4-8 is directed to an invention overlooked by Applicant in the original '447 application.

Claim 9 is directed to an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port, being operative to compress refrigeration fluid received via the suction port and discharged via the discharge port; a refrigerant flow line operative to carry refrigeration fluid and in fluid communication with the compressor; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals

received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity.

This critical aspect, a valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity, provides significant advantages in compressor capacity modulation. As discussed above, the specification discloses the advantages of cycling a valve with a cycling time shorter than the response time of the system to modulate compressor capacity.

Because none of original claims 1-3 recite the features of reissue claim 9, an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port, being operative to compress refrigeration fluid received via the suction port and discharged via the discharge port; a refrigerant flow line operative to carry refrigeration fluid and in fluid communication with the compressor; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity, reissue claim 9 is properly found to be independent and distinct from claims 1-3. Each of claims 10-13 depends directly or indirectly from claim 9 and is independent and distinct from original claims 1-3 for at least the same reasons.

Likewise, the invention of reissue claim 9 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port, being operative to compress refrigeration fluid received via the suction port and discharged via the discharge port; a refrigerant flow line operative to carry refrigeration fluid and in fluid communication with the compressor; a

capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Accordingly, each of claims 9-13 is independent and distinct from original claims 1-3, and each of claims 9-13 is directed to an invention overlooked by Applicant in the original '447 application.

Claim 14 is directed to an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port, being operative to compress refrigeration fluid received via the suction port and discharged via the discharge port; a refrigerant flow line operative to carry refrigeration fluid and in fluid communication with the compressor; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a solenoid valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity.

This critical feature, a solenoid valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity, provides significant advantages in compressor capacity modulation. As disclosed and discussed in the specification at Column 1, lines 25-32:

Gradual compressor capacity can be achieved by rapidly cycling solenoid valve(s) between fully open and fully closed positions ... The percentage of time that a valve is open determines the degree of modulation being achieved.

Because none of original claims 1-3 recite the features of reissue claim 14, an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid

suction port and a refrigeration fluid discharge port, being operative to compress refrigeration fluid received via the suction port and discharged via the discharge port; a refrigerant flow line operative to carry refrigeration fluid and in fluid communication with the compressor; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a solenoid valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity, reissue claim 14 is properly found to be independent and distinct from claims 1-3. Each of claims 15 and 16 depends directly or indirectly from claim 14 and is independent and distinct from original claims 1-3 for at least the same reasons.

Likewise, the invention of reissue claim 14 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited a an air conditioning or refrigeration system comprising a compressor having a refrigeration fluid suction port and a refrigeration fluid discharge port, being operative to compress refrigeration fluid received via the suction port and discharged via the discharge port; a refrigerant flow line operative to carry refrigeration fluid and in fluid communication with the compressor; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a solenoid valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity. Accordingly, each of claims 14-16 is independent and distinct from original claims 1-3, and each of claims 14-16 is directed to an invention overlooked by Applicant in the original '447 application.

Claim 17 is directed to a capacity modulated compressor for an air conditioning or refrigeration system having a refrigerant flow line, comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port operative to

pass refrigerant to the compression chamber, and at least one refrigerant discharge port operative to pass compressed refrigerant from the compression chamber; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity.

This critical feature, a valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity, provides significant advantages in compressor capacity modulation. As discussed above, the specification discloses the advantages of cycling a valve with a cycling time shorter than the response time of the system to modulate compressor capacity.

Because, none of original claims 1-3 recite the features of reissue claim 17, a capacity modulated compressor for an air conditioning or refrigeration system having a refrigerant flow line, comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port operative to pass refrigerant to the compression chamber, and at least one refrigerant discharge port operative to pass compressed refrigerant from the compression chamber; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity, reissue claim 17 is properly found to be independent and distinct from claims 1-3. Each of claims 18-23 depends directly or indirectly from claim 17 and is independent and distinct from original claims 1-3 for at least the same reasons.

Likewise, the invention of reissue claim 17 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited a capacity

modulated compressor for an air conditioning or refrigeration system having a refrigerant flow line, comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port operative to pass refrigerant to the compression chamber, and at least one refrigerant discharge port operative to pass compressed refrigerant from the compression chamber; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Accordingly, each of claims 17-23 is independent and distinct from original claims 1-3, and each of claims 17-23 is directed to an invention overlooked by Applicant in the original '447 application.

Claim 24 is directed to a capacity modulated compressor for an air conditioning or refrigeration system having a refrigerant flow line, comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port operative to pass refrigerant to the compression chamber, and at least one refrigerant discharge port operative to pass compressed refrigerant from the compression chamber; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a solenoid valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity.

This critical feature, a solenoid valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity, provides significant advantages in compressor capacity modulation. As discussed above, the specification discloses the advantages of cycling a solenoid valve between a fully open position and a fully closed position to modulate compressor capacity.

Because none of original claims 1-3 recite the features of reissue claim 24, a capacity modulated compressor for an air conditioning or refrigeration system having a refrigerant flow line, comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port operative to pass refrigerant to the compression chamber, and at least one refrigerant discharge port operative to pass compressed refrigerant from the compression chamber; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a solenoid valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity, reissue claim 24 is properly found to be independent and distinct from claims 1-3. Each of claims 25-28 depends directly or indirectly from claim 24 and is independent and distinct from original claims 1-3 for at least the same reasons.

Likewise, the invention of reissue claim 24 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited a capacity modulated compressor for an air conditioning or refrigeration system having a refrigerant flow line, comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port operative to pass refrigerant to the compression chamber, and at least one refrigerant discharge port operative to pass compressed refrigerant from the compression chamber; a capacity controller operative to generate a control signal corresponding to desired capacity modulation; and a solenoid valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity. Accordingly, each of claims 24-28 is independent and distinct from original claims 1-3, and each of claims 24-28 is directed to an invention overlooked by Applicant in the original '447 application.

Claim 29 is directed to a capacity modulated compressor comprising a compressor having a suction inlet for supplying suction gas to the compressor; a valve

provided in the suction gas flow path to the compressor, the valve being operable between open and closed positions to cyclically allow and prevent flow of suction gas into the compressor; a controller for actuating the valve between the open and closed positions, the controller being operative to cycle the valve such that its cycle time is shorter than the response time of the system to modulate compressor capacity.

These critical features, the valve being operable between open and closed positions to cyclically allow and prevent flow of suction gas into the compressor; a controller for actuating the valve between the open and closed positions, the controller being operative to cycle the valve such that its cycle time is shorter than the response time of the system to modulate compressor capacity, provides significant advantages in modulation of compressor capacity. As discussed above, the specification discloses the advantages of cycling a valve such that its cycle time is shorter than the response time of the system to modulate compressor capacity.

Because none of original claims 1-3 recite the features of reissue claim 29, a capacity modulated compressor comprising a compressor having a suction inlet for supplying suction gas to the compressor; a valve provided in the suction gas flow path to the compressor, the valve being operable between open and closed positions to cyclically allow and prevent flow of suction gas into the compressor; a controller for actuating the valve between the open and closed positions, the controller being operative to cycle the valve such that its cycle time is shorter than the response time of the system to modulate compressor capacity, reissue claim 29 is properly found to be independent and distinct from claims 1-3. Each of claims 30-32 depends directly or indirectly from claim 29 and is independent and distinct from original claims 1-3 for at least the same reasons.

Likewise, the invention of reissue claim 29 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited a capacity modulated compressor comprising a compressor having a suction inlet for supplying suction gas to the compressor; a valve provided in the suction gas flow path to the compressor, the valve being operable between open and closed positions to cyclically allow and prevent flow of suction gas into the compressor; a controller for actuating the

valve between the open and closed positions, the controller being operative to cycle the valve such that its cycle time is shorter than the response time of the system to modulate compressor capacity. Accordingly, each of claims 29-32 is independent and distinct from original claims 1-3, and each of claims 29-32 is directed to an invention overlooked by Applicant in the original '447 application.

Claim 33 is directed to a method of modulating the capacity of a compressor in an air conditioning or refrigeration system, comprising cycling a valve, in fluid communication with the compressor, using a cycle time shorter than the response time of the system to modulate compressor capacity.

This critical feature, cycling a valve, in fluid communication with a compressor, using a cycle time shorter than the response time of the system to modulate compressor capacity, provides significant advantages in modulation of compressor capacity. As discussed above, the specification discloses the advantages of cycling a valve using a cycle time is shorter than the response time of the system to modulate compressor capacity.

Because none of original claims 1-3 recite the features of reissue claim 33, a method of modulating the capacity of a compressor in an air conditioning or refrigeration system, comprising cycling a valve, in fluid communication with the compressor, using a cycle time shorter than the response time of the system to modulate compressor capacity, reissue claim 33 is properly found to be independent and distinct from claims 1-3. Claim 34 depends directly from claim 33 and is independent and distinct for at least the same reasons.

Likewise, the invention of reissue claim 33 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited a method of modulating the capacity of a compressor in an air conditioning or refrigeration system, comprising cycling a valve, in fluid communication with the compressor, using a cycle time shorter than the response time of the system to modulate compressor capacity. Accordingly, each of claims 33 and 34 is independent and distinct from original claims 1-

3, and each of claims 33 and 34 is directed to an invention overlooked by Applicant in the original '447 application.

Claim 35 is directed to a method of modulating the capacity of a compressor in a closed refrigerant circulating system, said compressor comprising a compression chamber having a port connected to a refrigerant line of the system through which refrigerant is supplied to the compression chamber, comprising rapidly cycling a solenoid valve disposed in the refrigerant line upstream of said port between its fully open position and its fully closed position to modulate compressor capacity.

This critical feature, rapidly cycling a solenoid valve disposed in the refrigerant line upstream of said port between its fully open position and its fully closed position to modulate compressor capacity, provides significant advantages in modulation of compressor capacity. As discussed above, the specification discloses the advantages of rapidly cycling a solenoid valve disposed in the refrigerant line upstream of said port between its fully open position and its fully closed position to modulate compressor capacity.

Because none of original claims 1-3 recite the features of reissue claim 35, a method of modulating the capacity of a compressor in a closed refrigerant circulating system, said compressor comprising a compression chamber having a port connected to a refrigerant line of the system through which refrigerant is supplied to the compression chamber, comprising rapidly cycling a solenoid valve disposed in the refrigerant line upstream of said port between its fully open position and its fully closed position to modulate compressor capacity, reissue claim 35 is properly found to be independent and distinct from claims 1-3. Claims 35-38 each depend directly from claim 34 and is independent and distinct for at least the same reasons.

Likewise, the invention of reissue claim 35 is properly found to be independent and distinct from all of the subject matter presented and prosecuted in the '447 application. In particular, no claim presented in the '447 application recited a method of modulating the capacity of a compressor in a closed refrigerant circulating system, said compressor comprising a compression chamber having a port connected to a refrigerant line of the system through which refrigerant is supplied to the compression chamber,

comprising rapidly cycling a solenoid valve disposed in the refrigerant line upstream of said port between its fully open position and its fully closed position to modulate compressor capacity. Accordingly, each of claims 35-38 is independent and distinct from original claims 1-3, and each of claims 35-38 is directed to an invention overlooked by Applicant in the original '447 application.

In summary, for the reasons discussed above, claims 4-38 are independent and distinct inventions from original claims 1-3 and are directed to subject matter originally overlooked by Applicant. So the recapture rule does not apply to any of claims 4-38. Accordingly, Applicant requests withdrawal of the rejection and either allowance of the claims or entry of a restriction requirement for claims 4-38. Additional and alternative grounds for allowance of the claims are discussed below.

**B. Claims 4-38 are Not Barred by the Recapture Rule – Recent Case Law**

A reissue claim that is broader in some respect than an original patent claim may nevertheless not be barred by the recapture rule. This was reinforced by the Federal Circuit in *In re Doyle* 01-1439 (decided June 12, 2002). A courtesy copy of *Doyle* is provided as Attachment A to this paper. In *Doyle*, the patentee successfully sought reissue claims that were broader than the originally issued claims. The reissue claims were prosecuted neither in the original application nor in a divisional application. The Federal Circuit found that the reissue claims were significantly broader than the original claims but were not of substantially similar scope. The court held that *Doyle* was permitted to seek the broader claims through reissue.<sup>2</sup>

Much like the facts in *Doyle*, where the court allowed a reissue applicant to seek via a reissue application claims to an invention disclosed but inadvertently not originally claimed in the issued patent, Applicant here is seeking reissue to claim inventions that were originally disclosed but not claimed in the '447 patent application. Just as in *Doyle*, present reissue claims 4-38 are not of substantially similar scope as original claims 1-3.

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<sup>2</sup> In *Doyle*, there was a 9-way restriction in the original application. Applicant prosecuted only the first elected invention. The reissue claims were directed to broad generic linking claims encompassing more than one of the nine groups of originally presented claims. The court held that *Doyle* could seek such claims in a reissue application.

Therefore, Applicant is statutorily permitted to seek the subject matter of claims 4-38 through reissue.

**C. Claims 4-38 do not Violate the Recapture Rule**

Assuming *arguendo* that the recapture rule could be applied to any of claims 4-38, nevertheless claims 4-38 are patentable because none of claims 4-38 violate the recapture rule. It is well established that application of the recapture rule is a three-step process:

- (i) the first step is to determine whether and in what aspect the reissue claims are broader than the patent claims;
- (ii) the second step is to determine whether the broader aspects of the reissue claims related to the surrendered subject matter; and
- (iii) finally, the court must determine whether the reissued claims were materially narrowed in other respects to avoid the recapture rule.

See *Pannu v. Storz Instruments*, 258 F.3d 1366, 59 USPQ2d 1597 (Fed. Cir. 2001). As discussed below, because the broader aspects of the reissue claims do not relate to surrendered subject matter, and because the reissue claims are materially narrower in other respects, claims 4-38 do not violate the recapture rule.

**i. The Scope of Each of Claims 4-38 Must be Considered**

The Examiner rejects claims 4-38 under the recapture rule, asserting that claims 4-38 are broader than claim 1 of the patent because claims 4-38 fail to recite several elements of claim 1. Applicant traverses the rejection.

It is well established that the proper focus is not on the differences between the reissue claim elements and the patent claim elements or on individual claim elements purportedly given up during prosecution of the original application. See *Ball Corp. v. U.S.*, 729 F.2d 1429, 1436, 221 USPQ 289, 295 (Fed. Cir. 1984). Instead, the proper focus is on the scope of the claims. The Examiner seemingly here has woodenly focused on the presence or absence of individual elements. As discussed below, when the scope of each of claims 4-38 is properly considered, claims 4-38 are not barred by the recapture

rule. In particular, for example, the subject matter of a valve operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity was never presented in any of original claims 1-3. Also, the subject matter of a valve operative to cycle between a fully open and a fully closed position was never presented in any of original claims 1-3. Accordingly, these features along with the other elements recited in the claims should be considered to determine the scope of the claims.

**ii. The Subject Matter of Each of Claims 4-38  
does not Relate to Subject Matter  
Surrendered During Prosecution of the '447 Application**

As discussed above, reissue claims 4-38 define inventions originally overlooked by Applicant. That is, each of claims 4-38 is directed to an independent and distinct invention that was originally disclosed by Applicant but not originally claimed. The discussion in Section A, above, is relevant here and is incorporated by reference.

As discussed above, the feature of a valve operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity was never presented in any of claims 1-3. Also, the feature of cycling a valve between a fully open and a fully closed position to modulate compressor capacity was never presented in any of claims 1-3. Thus, the subject matter of each of claims 4-38 does not relate to subject matter surrendered during prosecution of the '447 application, but instead the subject matter of each of claims 4-38 relates to independent and distinct inventions from that of claims 1-3. Accordingly, claims 4-38 are not barred by the recapture rule.

Further in this regard, it has been held that the purpose of the exception to the recapture rule is to allow the patentee to obtain through reissue a scope of protection to which he is rightfully entitled for such overlooked aspects. See *In Re Clement*, 131 F.3d 1464, 1469 (Fed. Cir. 1997).

As discussed above, each of the claims is directed to independent and distinct inventions, each of claims is directed to overlooked aspects present in the original application, and Applicant is entitled to seek a scope of protection to these independent and distinct inventions through reissue.

**iii. Claims 4-38 Are Materially Narrower in Other Aspects such that the Recapture Rule Would Not bar Claims 4-38 from Issuance**

Claims 4-38 are not barred by the recapture rule, even if that rule could properly be applied, because claims 4-38 include aspects or elements that render them, in those other aspects, materially narrower than original claims 1-3. It is well established that the recapture rule does not apply if the reissue claims sought are broader in some aspects but materially narrower in other aspects. See *Mentor Corp. v. Coloplast, Inc.*, 998 F.2d 992, 996, USPQ2d 1521, 1525 (Fed. Cir. 1993).

Claim 4 includes aspects that are materially narrower than any of claims 1-3 because claim 4 specifically recites a refrigeration fluid suction port, a refrigeration fluid discharge port, and a valve, in fluid communication with the compressor, operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. None of original claims 1-3 recite a refrigeration fluid suction port, a refrigeration fluid discharge port, and a valve in fluid communication with the compressor, operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Thus, claim 4 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Each of claims 5-8 depends directly or indirectly from claim 4 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 4-8 would not be barred by proper application of the recapture rule, even if that rule were applied.

Claim 9 includes aspects that are materially narrower than any of original claims 1-3 because claim 9 specifically recites a refrigeration fluid suction port, a refrigeration fluid discharge port, being operative to compress refrigeration fluid received via the suction port, a capacity controller operative to generate a control signal corresponding to desired capacity modulation, and a valve in the refrigerant flow line which is operatively

connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. None of original claims 1-3 recite a refrigeration fluid suction port, a refrigeration fluid discharge port, a capacity controller operative to generate a control signal corresponding to desired capacity modulation, and a valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Thus, claim 9 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Each of claims 10-13 depends directly or indirectly from claim 9 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 9-13 would not be barred by proper application of the recapture rule, even if that rule were applied.

Claim 14 includes aspects that are materially narrower than any of original claims 1-3 because claim 14 recites a compressor having a refrigeration fluid suction port, a refrigeration fluid discharge port, a capacity controller operative to generate a control signal corresponding to desired capacity modulation and a solenoid valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity. None of original claims 1-3 recite a compressor having a refrigeration fluid suction port, a refrigeration fluid discharge port, a capacity controller operative to generate a control signal corresponding to desired capacity modulation, and a solenoid valve in the refrigerant flow line which is operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle

between a fully open position and a fully closed position to modulate compressor capacity. Thus, claim 14 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Each of claims 15 and 16 depends directly or indirectly from claim 14 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 14-16 would not be barred by proper application of the recapture rule, even if that rule were applied.

Claim 17 includes aspects that are materially narrower than original claims 1-3 because claim 17 recites a capacity modulated compressor a compressor housing comprising a compression chamber, at least one refrigerant injection port, at least one refrigerant discharge port, a capacity controller, and a valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. None of original claims 1-3 recite a capacity modulated compressor a compressor housing comprising a compression chamber, at least one refrigerant injection port, at least one refrigerant discharge port, a capacity controller, and a valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Thus, claim 17 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Each of claims 18-23 depends directly or indirectly from claim 17 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 17-23 would not be barred by proper application of the recapture rule, even if that rule were applied.

Claim 24 includes aspects that are materially narrower than original claims 1-3 because claim 24 recites a capacity modulated compressor comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port, at least one refrigerant discharge port, a capacity controller, and a solenoid valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity. None of original claims 1-3 recite a capacity modulated compressor comprising a compressor housing comprising a compression chamber, at least one refrigerant injection port, at least one refrigerant discharge port, a capacity controller, and a solenoid valve operatively connected to the controller to receive capacity control signals from the controller and operative in response to capacity control signals received from the controller to cycle between a fully open position and a fully closed position to modulate compressor capacity. Thus, claim 24 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Each of claims 25-28 depends directly or indirectly from claim 24 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 24-28 would not be barred by proper application of the recapture rule, even if that rule were applied.

Claim 29 includes aspects that are materially narrower than original claims 1-3 because claim 29 recites a capacity modulated compressor comprising a compressor having a suction inlet for supplying suction gas to the compressor, a valve provided in the suction gas flow path to the compressor, the valve being operable between open and closed positions to cyclically allow and prevent flow of suction gas into the compressor, a controller for actuating the valve between the open and closed positions, the controller being operative to cycle the valve such that its cycle time is shorter than the response time of the system to modulate compressor capacity. None of original claims 1-3 recite a compressor having a suction inlet for supplying suction gas to the compressor, a valve

provided in the suction gas flow path to the compressor, the valve being operable between open and closed positions to cyclically allow and prevent flow of suction gas into the compressor, or a controller for actuating the valve between the open and closed positions, the controller being operative to cycle the valve such that its cycle time is shorter than the response time of the system to modulate compressor capacity. Thus, claim 29 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Each of claims 30-32 depends directly or indirectly from claim 29 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 29-32 would not be barred by proper application of the recapture rule, even if that rule were applied.

Claim 33 includes aspects that are materially narrower than original claims 1-3 because claim 33 recites a method of modulating the capacity of a compressor in an air conditioning or refrigeration system comprising cycling a valve, in fluid communication with the compressor, using a cycle time shorter than the response time of the system to modulate compressor capacity. None of original claims 1-3 recite a method of modulating the capacity of a compressor. In addition, none of original claims 1-3 recite cycling a valve, in fluid communication with the compressor, using a cycle time shorter than the response time of the system to modulate compressor capacity. Thus, claim 33 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Claim 34 depends directly from claim 33 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 33-34 would not be barred by proper application of the recapture rule, even if that rule were applied.

Claim 35 includes aspects that are materially narrower than original claims 1-3 because claim 35 recites a method of modulating the capacity of a compressor in a closed

refrigerant circulating system, said compressor comprising a compression chamber having a port connected to a refrigerant line of the system through which refrigerant is supplied to the compression chamber, comprising rapidly cycling a solenoid valve disposed in the refrigerant line upstream of said port between its fully open position and its fully closed position to modulate compressor capacity. None of original claims 1-3 recite a method of modulating the capacity of a compressor in a closed refrigerant circulating system. In addition, none of original claims 1-3 recite a compressor comprising a compression chamber having a port connected to a refrigerant line of the system through which refrigerant is supplied to the compression chamber, or rapidly cycling a solenoid valve disposed in the refrigerant line upstream of said port between its fully open position and its fully closed position to modulate compressor capacity. Thus, claim 35 is directed to an invention independent and distinct from that of claims 1-3; it defines an invention materially narrower in the above noted aspects than any of original claims 1-3.

Each of claims 36-38 depends directly or indirectly from claim 35 and, therefore, for at least the same reasons, is independent and distinct from original claims 1-3 and defines an invention materially narrower in the above noted aspects than any of original claims 1-3. Accordingly, each of claims 35-38 would not be barred by proper application of the recapture rule, even if that rule were applied.

For the reasons above, each of claims 4-38 is independent and distinct from original claims 1-3, and each of claims 4-38 include aspects that are materially narrower than any of original claims 1-3. Because claims 4-38 are independent and distinct from original claims 1-3 and include aspects that are materially narrower than any of original claims 1-3, the recapture rule does not bar issuance of claims 4-38. Accordingly, Applicant requests withdrawal of the rejection and allowance of the claims.

iv. **The Recapture Rule Cannot be Applied Rigidly**

It is well established that the recapture rule is based on equitable principles, and, therefore, rigid application of the recapture rule is impermissible. See *Ball Corp.*, supra, at 296. That is, the recapture rule should not automatically and unavoidably bar a reissue

claim only because the reissue claim is broader in some aspect when compared to the original claim.

As discussed above, each of claims 4-38 are directed to independent and distinct inventions originally overlooked by Applicant which are broader in at least one aspect. Also as discussed above, each of claims 4-38 include aspects which are materially narrower than aspects recited in original claims 1-3. In particular, none of original claims 1-3 recite a valve that is operative to cycle with a cycling time shorter than the response time of the system. In addition, none of original claim 1-3 recite a valve which is operative to cycle between a fully closed and a fully open position.

For the reasons above, the recapture rule does not apply to claims 4-38, and, therefore, claims 4-38 are not barred by the recapture rule, even if that rule is applied to claims 4-38. Applicant request withdrawal of the rejection and allowance of the claims.

v. **There is No Evidence that Scope of  
Original Claims 1-3 was not Patentable**

There exists no evidence in the prosecution history of the '556 patent that the original claims of the '447 patent application were not patentable. That is, nothing in the file wrapper of the '447 application establishes that claims 1-3 were amended because the claims were not patentable. It is well established that the recapture rule does not apply in the absence of evidence that the scope of an amended claim was not patentable without the amendment. See *In Re Clement*, supra. Accordingly, the conditions that are necessary for triggering application of the recapture rule are not present here, and, therefore, claims 4-38 are not barred by the recapture rule. Applicant requests withdrawal of the rejection and allowance of the claims.

**III. Claims 4, 5, 8, 9, 12, 14, 33 and 34 are Not Anticipated by Kountz**

Claims 4, 5, 8, 9, 12, 14, 33 and 34 are rejected under 102(b) as being anticipated by Kountz (US 4,132,086). Applicant traverses the rejection.

As discussed by Applicant in the Preliminary Amendment filed with this reissue application:

It is a significant and novel advantage that the cycling time of the valve is shorter than the response time of the system. Prior known air conditioning and refrigeration systems do not have this unique and useful feature.

Further, Applicant requested declaration of an interference between the instant application and U.S. Patent No. 6,206,652. The novel feature of U.S. Patent No. 6,206,652, which has a filing date after the effective filing date of the instant application, is said to be a control apparatus operative to cycle a valve at a cycle time substantially smaller than the time constant of the load on said compressor. For example, the '652 patent states in the Abstract states that:

Preferably the cycle time will be substantially less than the time constant of the load and will enable substantially continuously variable capacity modulation from substantially zero capacity to the full capacity of the compressor.

As discussed by Applicant in the Request for Interference filed with the reissue application, the terms time constant and response time have the same meaning. That is, the time required for a controlled variable to reach a specified value (definition of response time) is equivalent to the time required for a physical quantity to reach a specified value (definition of time constant). Accordingly, even after the filing date of the instant application, the feature of cycling a valve with a cycle time shorter than the response time of the system was perceived to be novel and patentable.

Kountz cannot anticipate any of claims 4, 5, 8, 9, 12, 14, 33 or 34, because Kountz fails to disclose, teach or suggest all the elements of any of claims 4, 5, 8, 9, 12, 14, 33 or 34. In particular, Kountz fails to expressly disclose, teach or suggest any port whatsoever. Kountz also fails to disclose, teach or suggest cycling a valve with a cycling time shorter than the response time of the system to modulate compressor capacity.

The Examiner asserts that Kountz cycles a valve less than the time constant of the load on the compressor since the valve is pulsed on and off repeatedly in order to adjust the stroke of the compressor. Applicant respectfully disagrees.

The disclosure of Kountz fails to recite expressly any step of cycling a valve with a cycling time shorter than the response time of the system to modulate compressor capacity. Though Kountz may pulse a valve on and off, such teaching does not provide the proper evidence to indicate that Kountz teaches cycling a valve using a cycling time shorter than the response time of the system. That is, in view of the disclosure of Kountz, Kountz fails to cycle any valve with a cycling time shorter than the response time of the system.

Instead, Kountz uses a special compressor (Kountz references US 3,861,829 which discloses the special compressor), which produces variable capacity using an internal mechanism that varies compressor displacement in response to crankcase pressure. That is, Kountz regulates crankcase pressure to control the compressor displacement. In the methods used by Kountz, compressor capacity, and thus the refrigerant flow through the system, is controlled to a steady value at a given operating condition.

Because the methods of Kountz operate by varying compressor displacement in response to crankcase pressure, the refrigerant flow in the methods of Kountz is not pulsed in any manner. Further, because the refrigerant flow is not pulsed, Kountz would never even contemplate issues such as, for example, the response time of the system, cycling a valve with a cycling time shorter than the response time of the system, or cycling a valve between a fully open position and a fully closed position. That is, because the method of Kountz regulates crankcase pressure to control compressor displacement, Kountz would have no motivation to even contemplate the response time of the system. Accordingly, the methods of Kountz are strikingly different from the subject matter of claims 4, 5, 8, 9, 12, 14, 33 and 34.

Further, each of claims 4, 5, 8, 9, 12, and 14 recite at least one port. Kountz fails to even mention that his temperature control system includes a port. Thus, clearly Kountz does not teach all the elements of claims 4, 5, 8, 9, 12 and 14.

Claims 33 and 34 recite cycling a valve using a cycling time shorter than the response time of the system to modulate compressor capacity. As discussed above, Kountz fails to discuss any cycling time for his temperature control system or cycling a valve using a cycle time shorter than the response time of the system. Thus, Kountz fails to teach all the elements of claims 33 and 34.

For the reasons above, Kountz fails to disclose, teach or suggest all the elements of the claims, and, thus, Kountz cannot anticipate any of claims 4, 5, 8, 9, 12, 14, 33 or 34.

**IV. Claims 6, 7, 10, 11 and 15 are Not Obvious over Kountz in view of Benevelli et al.**

Claims 6, 7, 10, 11 and 15 are rejected under 103(a) as being unpatentable over Kountz in view of Benevelli et al. (US 5,226,472). Applicant traverses the rejection.

As discussed above, Kountz differs greatly from the subject matter of the present claims. Briefly, the method of Kountz regulates crankcase pressure to control compressor displacement, and, therefore, Kountz would have no motivation to even consider the response time of the system or cycling a valve with a cycling time shorter than the response time of the system.

Benevelli et al. fails to cure the deficiencies of Kountz. Instead, Benevelli et al. discloses pulse width modulation to regulate electric power supplied to a heater. While Benevelli et al. refers to controlling system capacity by regulating refrigerant flow through a valve which acts in response to a pulse width modulated signal, this teaching of Benevelli et al. does not involve cycling a valve. In fact, the valve used in Benevelli et al. is not cycled. Instead, the valve used by Benevelli et al. is a continuously modulating throttle valve.

Benevelli et al.'s use of a continuously modulating throttle valve to regulate capacity does not involve consideration of the response time of the system. In implementing Benevelli et al., one skilled in the art would not consider the response time of the system. It necessarily follows, therefore, that one skilled in the art would not consider cycling a valve with a cycle time shorter than the response time of the system or

cycling a valve between a fully open position and a fully closed position. Accordingly, the methods of Benevelli et al. are strikingly different from the subject matter of the present reissue claims, and, therefore, the combination of Kountz and Benevelli et al. fails to render obvious the subject matter of any of the reissue claims.

Neither Kountz nor Benevelli et al. pulse or otherwise regulate refrigerant flow in a discontinuous fashion. They both use discontinuous control signals to achieve continuous modulation for smooth, continuous refrigerant flow. Therefore, the teachings of both Kountz and Benevelli et al. differ greatly from the subject matter of the present invention.

Each of claims 6 and 7 depends directly or indirectly from claim 4, which recites an air conditioning or refrigeration system comprising at least one port and also recites cycling a valve with a cycling time shorter than the response time of the system. As discussed above, the methods of Kountz and Benevelli et al. are strikingly different from the methods and apparatus of the present invention. That is, the combination of Kountz and Benevelli et al. does not disclose, teach or suggest the subject matter defined by claims 6 and 7. In particular, the combination of Kountz and Benevelli et al. does not disclose, teach or suggest cycling a valve with a cycling time shorter than the response time of the system. Accordingly, claims 6 and 7 are not rendered obvious by the combination of Kountz and Benevelli et al.

Each of claims 10 and 11 depends directly or indirectly from claim 9. Claim 9 recites an air conditioning or refrigeration system comprising at least one port and a valve operative to cycle with a cycling time shorter than the response time of the system. As discussed above, because the teachings of each of Kountz and Benevelli et al. differs so greatly from the subject matter of the present claims, the combination of Kountz and Benevelli et al. fails to render obvious any of the claims. That is, the combination of Kountz and Benevelli et al. fails to disclose, teach or suggest cycling a valve with a cycling time shorter than the response time of the system. Accordingly, the subject matter of either of claims 10 or 11 is not disclosed, taught or suggested by Kountz and Benevelli et al.

Claim 15 depends from claim 14. Claim 14 recites an air conditioning or refrigeration system comprising a compressor having at least one port and a solenoid valve operative to cycle between a fully open and a fully closed position. As discussed above, because the teachings of each of Kountz and Benevelli et al. differs so greatly from the subject matter of the present claims, the combination of Kountz and Benevelli et al. fails to render obvious any of the claims. That is, the combination of Kountz and Benevelli et al. does not disclose, teach or suggest an air conditioning or refrigeration system comprising a compressor having at least one port and cycling a valve between fully open and fully closed positions to modulate compressor capacity. Therefore, the combination of Kountz and Benevelli et al. fails to render obvious the subject matter of claim 15.

Because the combination of Kountz and Benevelli et al. fails to disclose, teach or suggest the subject matter of any of claims 6, 7, 10, 11 and 15, the combination of Kountz and Benevelli et al. does not render any of claims 6, 7, 10, 11 and 15 obvious.

V. **Claims 17-19 are not Obvious over Kountz**

Claims 17-19 are rejected under 103(a) as being unpatentable over Kountz. Applicant traverses the rejection.

As discussed above, the methods of Kountz are strikingly different from the methods and apparatus of the present claims. Kountz uses a special compressor to vary compressor displacement in response to crankcase pressure. That is, Kountz regulates crankcase pressure to control the compressor displacement. Because the methods of Kountz operate by varying compressor displacement in response to crankcase pressure, the refrigerant flow in the methods of Kountz is not pulsed in any manner. Further, because the refrigerant flow is not pulsed, Kountz would never consider issues such as, for example, the response time of the system, cycling a valve with a cycling time shorter than the response time of the system, or cycling a valve between a fully open position and a fully closed position. That is, because the method of Kountz regulates crankcase pressure to control compressor displacement, Kountz would not even contemplate the response time of the system. Thus, the disclosure of Kountz fails to disclose, teach or

suggest any step of cycling a valve with a cycling time shorter than the response time of the system to modulate compressor capacity.

Each of claims 17-19 recites a refrigeration injection port, a refrigeration discharge port and a valve that is cycled with a cycling time shorter than the response time of the system. As discussed above, Kountz fails to disclose, teach or suggest cycling a valve with a cycle time shorter than the response time of the system. Accordingly, Kountz cannot render any of claims 17-19 obvious.

**VI.     Claims 18, 21, 24, 25, 27, 33, 35, 36 and 38 are  
Not Obvious over Kountz in view of Benevelli et al.**

Claims 18, 21, 24, 25, 27, 33, 35, 36 and 38 are rejected under 103(a) as being unpatentable over Kountz in view of Benevelli et al. Applicant traverses the rejection.

Kountz uses a special compressor to vary compressor displacement in response to crankcase pressure. That is, Kountz regulates crankcase pressure to control the compressor displacement. Because the methods of Kountz operate by varying compressor displacement in response to crankcase pressure, the refrigerant flow in the methods of Kountz is not pulsed in any manner. Further, because the refrigerant flow is not pulsed, Kountz would never consider issues such as, for example, the response time of the system, cycling a valve with a cycling time shorter than the response time of the system or cycling a valve between a fully closed and a fully open position. That is, because the method of Kountz regulates crankcase pressure to control compressor displacement, the response time of the system would not be considered by Kountz.

Benevelli et al. fails to cycle any valve at all. Instead, the valve used by Benevelli et al. is a continuously modulating throttle valve. The use of a continuously modulating throttle valve does not involve consideration of the response time of the system. That is, in applying the methods used by Benevelli et al., the response time of the system would never be considered nor should it be.

Each of claims 18 and 21 depend from claim 17. Claim 17 recites a capacity modulated compressor comprising a compressor having at least one port and a valve operative to cycle with a cycling time shorter than the response time of the system to

modulate compressor capacity. As discussed above, the combination of Kountz and Benevelli et al. fails to disclose, teach or suggest a valve operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Thus, claims 18 and 21 are not obvious over Kountz and Benevelli et al.

Claim 24 recites a capacity modulated compressor comprising at least one port and a solenoid valve operative to cycle between a fully open position and a fully closed position to modulate compressor capacity. The combination of Kountz and Benevelli et al. fails to disclose, teach or suggest a valve operative to cycle between a fully open position and a fully closed position to modulate compressor capacity. Thus, claim 24 is not obvious over the combination of Kountz and Benevelli et al.

Each of claims 25 and 27 depends directly or indirectly from claim 24. Thus, each of claims 25 and 27 are not rendered obvious by the combination of Kountz and Benevelli et al. for at least the same reasons.

Claim 33 recites a method of modulating the capacity of a compressor comprising cycling a valve using a cycling time shorter than the response time of the system to modulate compressor capacity. As discussed above, the combination of Kountz and Benevelli et al. fails to disclose, teach or suggest a valve operative to cycle with a cycling time shorter than the response time of the system to modulate compressor capacity. Thus, claim 33 is not obvious over the combination of Kountz and Benevelli et al.

Claim 35 recites a method of modulating the capacity of a compressor by rapidly cycling a solenoid valve, disposed in a refrigerant line upstream of a port, between its fully open and fully closed position to modulate compressor capacity. The combination of Kountz and Benevelli et al. fails to disclose, teach or suggest cycling a solenoid valve, disposed in a refrigerant line upstream of a port, between its fully open and fully closed position to modulate compressor capacity. Thus, claim 35 is not obvious over the combination of Kountz and Benevelli et al.

Claims 36 and 38 each depends directly or indirectly from claim 35. Thus, claims 36 and 38 are not rendered obvious by Kountz in view of Benevelli et al. for at least the same reasons.

Therefore, because the combination of Kountz and Benevelli et al. fails to disclose, teach or suggest the subject matter of any of claims 18, 21, 24, 25, 27, 33, 35, 36 and 38, the combination of Kountz and Benevelli et al. does not render any of claims 18, 21, 24, 25, 27, 33, 35, 36 and 38 obvious.

## VII. Conclusion

Having addressed all outstanding issues, Applicant requests withdrawal of all rejections and issuance of the case.

Respectfully submitted,  
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